

Name:

Handrick - Key

Date:

Period:

TOXINS REVIEW: Lessons 1-6, 24

LESSON 1: CHEMICAL EQUATIONS

- In the chemical equation to the right: $2\text{HCl}(\text{aq}) + \text{Cr}(\text{s}) \rightarrow \text{CrCl}_2(\text{aq}) + \text{H}_2(\text{g})$
 - What are the reactants? HCl , Cr
 - What are the products? CrCl_2 , H_2
 - What do *aq*, *s*, and *g* indicate? phases (*aq*) is aqueous; (*s*) is solid; (*g*) is gas
 - What is the purpose of a chemical equation?
Easily shows changes in matter; keeps track of changes
- What is a toxic substance? List 3 effects they have on the body. Harmful substance
e.g. kidney stones, blood acidosis, toxic metals react with "good" metals, nerve damage, damage to eyes, nose, throat

LESSON 2: OBSERVING CHANGE

- Describe in words what you would observe in each of the following changes:
 - $\text{NaCl}(\text{s}) \rightarrow \text{NaCl}(\text{aq})$
Solid disappearing into solution
 - $2\text{NaCl}(\text{l}) \rightarrow 2\text{Na}(\text{l}) + \text{Cl}_2(\text{g})$
Liquid and then gas bubbling through liquid
 - $2\text{NaCl}(\text{aq}) + 2\text{H}_2\text{O}(\text{l}) \rightarrow 2\text{NaOH}(\text{aq}) + \text{Cl}_2(\text{g}) + \text{H}_2(\text{g})$
Solution and then gas bubbling through solution
- What information is provided in a chemical equation that cannot be physically observed?
e.g. Identity of chemicals; ratios of reactants/products; liquid vs. solution
- What information must be physically observed and is not present in a chemical equation?
e.g. Smell, color, reaction rate, texture, etc.
- Write a chemical equation for:
 - Solid MgS dissolves. $\text{MgS}(\text{s}) \rightarrow \text{MgS}(\text{aq})$
 - Gaseous methane (CH_4) and gaseous oxygen (O_2) produce carbon dioxide gas and liquid water.
 $\text{CH}_4(\text{g}) + \text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{l})$
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LESSON 3: PHYSICAL VERSUS CHEMICAL CHANGE

1. Describe the difference between a physical and a chemical change.

Physical: No change in chemical ~~equation~~ composition

Chemical: Changes chemical make-up/formula

2. Describe the difference between sugar decomposing and sugar melting.

Decomposing: Sugar undergoes chemical change - becomes different chemical substance

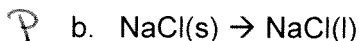
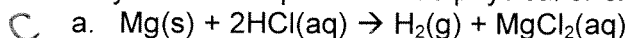
Sugar melting: Physical phase change only from s → l

3. Why is dissolving considered both a physical and a chemical change?

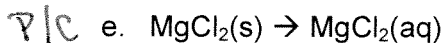
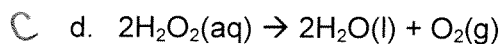
Physical: Chemical compound can be recovered intact w/no change to formula

Chemical: Broken down into ions → change in chem. composition

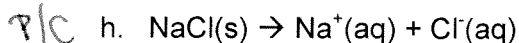
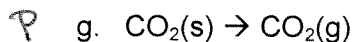
4. Classify each example below as physical or chemical:



P c. A fork is bent.



C f. A piece of iron rusts.



C i. Kindling burns.

C j. Food digests in the stomach.

P k. A piece of metal is magnetized.

C l. A water molecule decomposes.

5. What are three observations that indicate a chemical change might be taking place?

color change

formation of solid

bubbling

LESSON 4: CONSERVATION OF MASS

1. Define the law of conservation of mass.

In a chemical/physical change, matter cannot be gained nor lost



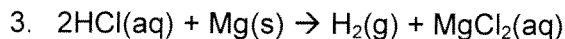
- a. If the combined mass of the reactants is 10 grams, how many grams of water will be produced? 10 g

- b. If the mass of the hydrogen gas is 4 grams and the mass of the water is 6 grams, what is the mass of the oxygen gas? 2 g

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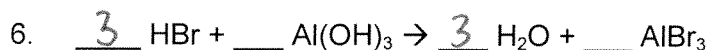
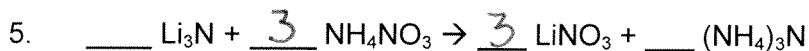
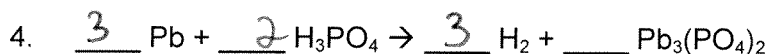
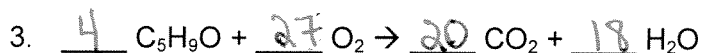
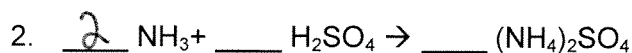
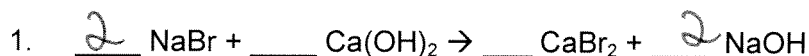
a) The reaction above is carried out in a closed container. The mass of the reactants is 8 grams. What is the mass of the products? 8 g

b) The reaction above is carried out in an open container. Will the mass of the products be greater than or less than 8 grams? Why?

< 8 g In an open container, some gas escapes

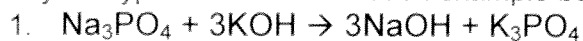
LESSON 5: BALANCING CHEMICAL EQUATIONS

Balance each equation below:

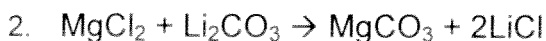


LESSON 6: TYPES OF REACTIONS

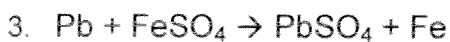
Identify the type of reaction for each example below:



Reaction Type Double Exchange



Reaction Type Double Exchange



Reaction Type Single Exchange



Reaction Type Decomposition

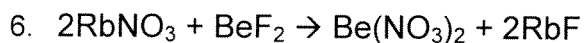


Reaction Type Combination

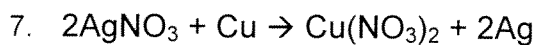
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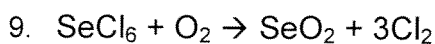
Reaction Type Double Exchange



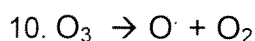
Reaction Type Single Exchange



Reaction Type Combination



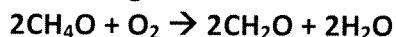
Reaction Type Single Exchange



Reaction Type Decomposition

LESSON 24: MOLE RATIOS

1. Use the following reaction to answer each question below:



- a. How many moles of each reactant are needed to make 8 mol
- H_2O
- ?

8 mol CH_4O and 4 mol O_2

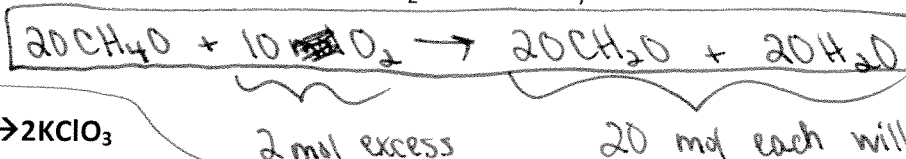
- b. How many moles of
- O_2
- are needed to completely react with 6 mol
- CH_4O
- ?

6 mol CH_4O will require 3 mol O_2 to react completely (2:1 ratio)

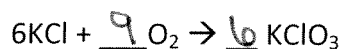
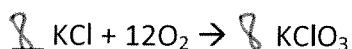
- c. If 16 mol
- CH_4O
- react with 8 mol
- O_2
- , how many moles of each product will form?

16 mol of each product

- d. If 20 mol
- CH_4O
- react with 12 mol
- O_2
- , how many moles of each product will form?

(*Hint: O_2 is in excess. How much excess O_2 is left over?)

- a) Fill in the missing coefficients to maintain the correct mole ratio.



- b) Which reactant is in excess if 25 mol
- KCl
- combine with 30 mol
- O_2
- ? How much is left over?

1) 25 KCl will form 25 mol of product (KClO_3)2) 30 mol O_2 will form 20 mol of KClO_3 3) O_2 is limiting since it forms less product

4) Write equation using the one based on limiting reactant:



5 mol left over b/c had 25 mol originally